Listing of Claims

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Previously Presented) A method comprising:

generating an electromagnetic radiation;

linearly polarizing at least a portion of the radiation in a vicinity of a pupil plane of a projection system to form linearly polarized radiation; and

exposing a substrate using the linearly polarized radiation at a high exposure angle,

wherein the portion of the radiation is linearly polarized in a direction that is dependent upon a direction of the exposure angle of the radiation.

Claim 2. (Canceled)

3. (Original) The method of claim 1, wherein said linearly polarizing the radiation comprises increasing a proportion of radiation polarized in a direction substantially perpendicular to a propagation direction and substantially parallel to a surface of the substrate.

4. (Original) The method of claim 3, wherein increasing the proportion of radiation polarized in the direction comprises completely linearly polarizing the radiation in the direction.

5. (Original) The method of claim 1, wherein said linearly polarizing the radiation comprises transmission polarizing the radiation at the pupil plane.

6. (Original) The method of claim 1, wherein said linearly polarizing the radiation comprises birefringence polarizing the radiation at the pupil plane.

7. (Previously Presented) The method of claim 1, wherein said linearly polarizing the radiation comprises linearly polarizing an annular ring of radiation at the pupil plane so that the polarization direction at each direction of the exposure angle in the ring is substantially parallel to a tangent to the ring at that direction of the exposure angle.

8. (Original) The method of claim 1, wherein said linearly polarizing the radiation comprises linearly polarizing radiation in an opposing pair of regions at high exposure angles in the pupil plane.

9. (Original) The method of claim 1, wherein said high exposure angle is an angle greater than 45°.

10. (Original) The method of claim 1, wherein exposing the substrate comprises exposing the substrate at a low exposure angle using circularly polarized radiation.

11. (Original) The method of claim 1, wherein exposing the substrate comprises exposing the substrate using an immersion lithography system.

12. (Original) A method comprising:

generating an electromagnetic radiation;

shifting a phase of some of the radiation using an alternating phase shift mask to define a pattern, the pattern including

first features oriented with a main axis in a first direction and

second features oriented with a main axis in a second direction, the second direction being substantially perpendicular to the first direction;

linearly polarizing at least a portion of the radiation to form linearly polarized radiation; and

exposing a substrate using the linearly polarized radiation at a high exposure angle.

13. (Original) The method of claim 12, wherein said linearly polarizing the portion comprises linearly polarizing the portion substantially perpendicular to a propagation direction and substantially parallel to a surface of the substrate.

14. (Original) The method of claim 12, wherein said linearly polarizing the portion comprises linearly polarizing the portion in a vicinity of a pupil plane of a projection system.

15. (Original) The method of claim 12, further comprising exposing the substrate at a low exposure angle using a second portion of the generated electromagnetic radiation, the second portion not being linearly polarized.

16. (Original) The method of claim 15, wherein said exposing the substrate using the second portion comprises exposing the substrate using circularly polarized radiation.

17. (Previously Presented) The method of claim 12, wherein said exposing the substrate comprises exposing the substrate using radiation forming an annular ring in the pupil plane,

wherein, at each direction of the exposure angle in the annular ring, the radiation is polarized in a direction that is substantially parallel to a tangent to the ring at that direction of the exposure angle.

18. (Original) The method of claim 12, wherein said exposing the substrate using the first portion comprises polarizing the electromagnetic radiation using a reflection polarizer.

19. (Original) The method of claim 12, wherein said high exposure angle comprise an exposure angle greater than 45°.

20. (Previously Presented) A lithography system comprising:

a stage to immobilize a substrate;

an electromagnetic radiation source to emit a radiation; and

a projection system having a polarizer in a vicinity of a pupil plane to increase a proportion of radiation linearly polarized in a direction that is substantially perpendicular to a propagation direction of the radiation, parallel to a surface of an immobilized substrate, and dependent upon a direction of the exposure angle of the radiation.

21. (Original) The system of claim 20, wherein the polarizer comprises a perfectly linear polarizer to perfectly linearly polarize the radiation.

22. (Original) The system of claim 20, wherein the polarizer comprises a high exposure angle polarizer to increase the proportion of linearly polarized radiation that is to expose the substrate at a high exposure angle.

23. (Original) The system of claim 20, wherein the polarizer includes an opposing pair of polarizing regions at high exposure angles.

24. (Currently Amended) The system of claim 20, wherein the projection system further comprises a unitary polarizer to increase the proportion of linearly polarized radiation at the pupil plane.

25. (Original) The system of claim 20, wherein the polarizer comprises a transmission polarizer.

26. (Previously Presented) The system of claim 25, wherein the transmission polarizer comprises an annular ring of polarizing features arranged to polarize the radiation in a direction that is substantially parallel to a tangent to the annular ring at each direction of the exposure angle.

27. (Original) The system of claim 20, wherein the polarizer comprises a birefringence polarizer.

28. (Original) The system of claim 20, further comprising an alternating phase shift mask.

29. (Previously Presented) A lithography system for forming microelectronic devices, the improvement comprising a pupil plane polarizer to polarize electromagnetic radiation that is to expose a substrate at high exposure angles but not polarize electromagnetic radiation at low exposure angles, wherein the electromagnetic radiation at high exposure angles is

polarized in a direction that is dependent upon a direction of the high exposure angles.

30. (Original) The system of claim 29, wherein the polarizer is to increase the proportion of linearly polarized electromagnetic radiation in a direction perpendicular to a propagation direction of the radiation and parallel to a surface of a substrate.